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INTRODUCTION.

The general meteorological conditions which prevailed over the United States during November, 1883, as compiled from the reports from the Signal Service and voluntary observers, and from the monthly reports of state weather services, are shown in this REVIEW.

The month has been marked by a succession of severe storms, which resulted in great damage to shipping interests, especially on the lakes.

The paths of nine atmospheric depressions, which are described under "areas of low barometer," are shown on chart i. During the passage of the depression charted as number vi., severe local storms occurred in the Ohio and Mississippi valleys.

On the afternoon of the 5th a tornado visited Springfield, Missouri, causing considerable loss of life and the destruction of much property.

The mean temperature of the month averaged above the normal over the whole country, except in the middle Pacific coast region, where it was lower than the average. Over the middle slope and northern plateau the departures above the normal temperature exceeded 7°.

Large deficiencies in the monthly precipitation occurred in the districts on the Atlantic and Pacific coasts, while in the Gulf states, Ohio valley, upper lake region, and northern Rocky mountain districts, the precipitation exceeded the November average.

A peculiar appearance of the sky after sunset and before sunrise has been generally observed throughout the United States at intervals during the month.

Under the heading "north Atlantic storms" are described thirteen storms which occurred over the north Atlantic ocean during November, the paths of which are approximately shown on chart ii.

In the preparation of this REVIEW the following data, received up to December 20th, have been used, viz.: the regular tri-daily weather-charts, containing data of simultaneous observations taken at one hundred and twenty-two Signal Service stations and sixteen Canadian stations, as telegraphed to this office; one hundred and sixty-two monthly journals, and one hundred and forty-one monthly means from the former, and sixteen monthly means from the latter; two hundred and sixty-three monthly registers from voluntary observers; fifty-two monthly registers from United States Army post surgeons; marine records; international simultaneous observations; marine reports, through the co-operation of the "New York Herald Weather Service;" abstracts of ships' logs, furnished by the publishers of "The New York Maritime Register;" monthly weather reports from the local weather services of Indiana, Iowa, Kansas, Nebraska, Ohio, and Tennessee, and of the Central Pacific railway company; trustworthy newspaper extracts; and special reports.

ATMOSPHERIC PRESSURE.

[*Expressed in inches and hundredths.*]

The distribution of mean atmospheric pressure for November, 1883, determined from the tri-daily telegraphic observations of the Signal Service, is shown by the isobarometric lines on chart iii. Two areas of barometric maxima are shown on the chart named. One of these covers a region extending from northwestern Texas to Utah, and is inclosed by the isobar of 30.2, the highest barometric mean, 30.28, being reported from Salt Lake City, Utah; while the other (also inclosed by the isobar of 30.2) extends from the Mississippi river to the Atlantic coast, between the thirty-second and thirty-seventh parallels of latitude. Over a small area, including northern Georgia, western South Carolina, and southeastern Tennessee, the monthly mean pressures have been 30.25. To the northward of the regions of greatest pressure, the barometric means decrease to 29.99 at stations in the extreme northwest and lake region, and to 29.95, at Father Point, Quebec; to the southward they decrease to 30.04 at San Diego, California, and to 30.05 at Key West, Florida.

Compared with the mean pressure of the preceding month (October), there has been a decrease, varying from .01 to .14, in the nothern districts from Minnesota eastward to New England. In all other sections of the country the mean pressure has been greater than in the preceding month. The greatest increase is shown in Arizona, Colorado, and Utah, where, at some stations, it exceeded .25. On the middle Pacific coast and over the southern districts from New Mexico to the south Atlantic coast, the increase varied from .10 to .20. In the other districts, where an increase has taken place, it has been less than .10

DEPARTURES FROM THE NORMAL VALUES FOR THE MONTH.

The mean pressure for November, 1883, has been below the normal for the corresponding month in all parts of the United States, except at a few stations in the south Atlantic and eastern Gulf states where it has been from .01 to 0.3 above. The greatest departures below the normal have occurred from the upper lake region westward to Idaho, where they ranged from .12 to .16. In New England, the lake region, upper Mississippi and Missouri valleys the departures varied from .05 to .08, and in the other districts they were less marked.

BAROMETRIC RANGES.

The barometric ranges for November, 1883, were greatest in New England, the lake region, extreme northwest, upper Mississippi and Missouri valleys. They were least in California, Florida, and in the eastern Gulf states. Over the entire country the extreme ranges were: smallest, .27 at San Diego, California, and .29 at Key West, Florida; largest, 1.59 at Eastport, Maine, and 1.61 on the summit of Mount Washington, New Hampshire.

In the several districts the monthly barometric ranges varied as follows:

New England.—From .92 at New Haven, Connecticut, to 1.61 on the summit of Mount Washington, New Hampshire.

Middle Atlantic states.—From .75 at Lynchburg, Virginia, to 1.00 at Delaware Breakwater, Delaware.

South Atlantic states.—From .48 at Jacksonville, Florida, to .71 at Kittyhawk, North Carolina.

Florida peninsula.—From .29 at Key West to .40 at Cedar Keys.

Eastern Gulf.—From .57 at Pensacola, Florida, to .85 at Vicksburg, Mississippi.

Western Gulf.—From .80 at Galveston, Texas, to 1.08 at Little Rock, Arkansas.

Rio Grande valley.—From .64 at Brownsville, Texas, to .86 at Rio Grande City, Texas.

Tennessee.—From .72 at Chattanooga, to .99 at Memphis.

Ohio valley.—From .91 at Pittsburg, Pennsylvania, to 1.04 at Indianapolis, Indiana.

Lower lakes.—From .92 at Buffalo, New York, to 1.13 at Oswego, New York.

Upper lakes.—From 1.04 at Milwaukee, Wisconsin, to 1.32 at Duluth, Minnesota.

Extreme northwest.—From 1.10 at Fort Buford, Dakota, to 1.26 at Saint Vincent, Minnesota.

Upper Mississippi valley.—From 1.10 at Cairo, Illinois, to 1.24 at Saint Paul, Minnesota.

Missouri valley.—From 1.10 at Huron and Yankton, Dakota, to 1.27 at Leavenworth, Kansas.

Northern slope.—From .82 at Cheyenne, Wyoming, to 1.15 at Fort Assiniboine, Montana.

Middle slope.—From .81 on the summit of Pike's Peak, Colorado, to .98 at Fort Elliot, Texas.

Southern slope.—From .58 at Fort Concho, Texas, to .77 at Fort Stockton, Texas.

Southern plateau.—From .50 at Forts Apache and Grant, Arizona, to .75 at El Paso, Texas.

Middle plateau.—1.04 at Salt Lake City, Utah.

Northern plateau.—From .99 at Dayton, Washington Territory, to 1.03 at Spokane Falls, Washington Territory.

North Pacific coast.—From .85 at Roseburg, Oregon, to .99 at Olympia, Washington Territory.

Middle Pacific coast.—From .39 at San Francisco, California, to .58 at Red Bluff, California.

South Pacific coast.—From .27 at San Diego, California, to .31 at Los Angeles, California.

AREAS OF HIGH BAROMETER.

Eight areas have been traced during the month. As a rule they have been quite extensive and moved with considerable rapidity. A majority have moved in a more southerly direction than usual. Numbers iii. and iv. were dissipated after reaching Kansas and the Indian Territory. Number vii. was dissipated after reaching southern Illinois. The minimum temperature for the month occurred in nearly all districts during the passage of number iv.

I.—This area is the same as described in the REVIEW for October as number v. On the morning of the 1st it embraced all districts east of the Missouri valley. At this report the centre of area was over the southern portion of the Missouri valley. On the 2d it was central over the lower Mississippi valley. The morning report of the 3d showed the pressure to be greatest over Georgia, and on the 4th the area passed into the Atlantic. The direction of movement was southeasterly. Killing frosts occurred in Indian Territory, Tennessee, Kentucky, Alabama, Georgia, North and South Carolina, during its passage, and brisk to high winds prevailed on the lakes and Atlantic coast.

II.—This area made its appearance on the north Pacific coast on the morning of the 4th. On the 5th it extended over nearly all territory west of the Missouri river. The morning report of the 6th showed it to be central over Kansas and the Indian Territory. After this report it changed its previous southeasterly movement to a northeasterly direction, and, on the 7th, the centre of area was over Ohio and the lower lake region. Passing over the middle Atlantic states the area disappeared on the 8th.

III.—The pressure increased rapidly, during the evening of the 10th, over the territory north of Montana, and the morning report of the 11th showed that the area had moved in a southerly direction and was central in western Dakota. It continued its southerly movement during the 11th, and on the morning of the 12th its centre was over Kansas and the Indian Territory. During the 12th the pressure rapidly diminished and became obliterated. The first frost of the season reported from Louisiana occurred in the northern portion of that state during the passage of this area.

IV.—The reports from the Saskatchewan valley at the midnight report of the 12th showed the presence of an area of high pressure over that region. On the morning of the 13th the pressure had greatly increased over Dakota and Montana, the greatest change being .63 of an inch. The area moved in a direction a little east of south, and on the 14th it was central over Kansas and the Indian Territory. This area was almost identical in its movement and extent with high area number iii., and, like it, after reaching Kansas, the pressure rapidly diminished and the area dissipated.

V.—This area made its appearance on the 14th north of Dakota, moving southeastwardly. On the morning of the 15th it was central over Dakota, where the barometer stood .49 of an inch above the normal. The morning report of the 16th showed the pressure to be greatest over the Mississippi valley. After the 16th the area moved in a more easterly direction, and disappeared into the Atlantic off the Virginia coast on the 17th. The lowest temperatures observed during the month occurred in the various districts east of the Rocky mountains during the passage of this area.

VI.—This area appeared on the 23d in the extreme northwest, moving easterly. On the morning of the 24th it was central over Manitoba. The morning report of the 25th showed the area to have continued its easterly movement, and was central over the Saint Lawrence valley. On the 26th the pressure was greatest over the Gulf of Saint Lawrence, and on that date the area passed beyond the limits of observation.

VII.—The afternoon report of the 25th showed the presence of this area on the California coast. By the morning of the 26th it had moved in a direction a little east of south, and was central over Kansas and the Indian Territory. From thence it pursued a more easterly direction, and on the morning of the 27th the centre of area was over southern Illinois, where the pressure was .40 of an inch above the normal. After this report the pressure slowly diminished, and the area became obliterated on the 28th.

VIII.—On the 27th this area was central in the Saskatchewan valley, moving southeasterly. On the 28th the greatest pressure was over northern Dakota, the barometer standing .50 of an inch above the normal. During the 28th the pressure diminished rapidly as the area moved southeasterly to the middle Atlantic coast, where it was central on the 29th. On the last named date it passed into the Atlantic, greatly diminished in extent and pressure.

AREAS OF LOW BAROMETER.

The following table shows the latitudes and longitudes in which each depression was first and last observed, and the average hourly velocity of each depression within the limits of observation:

Areas of low barometer.	First observed.		Last observed.		Average velocity in miles per hour.
	Lat. N.	Long. W.	Lat. N.	Long. W.	
	° ′	° ′	° ′	° ′	
No. I.	53 00	102 00	49 00	59 00	30.6
II.	40 00	96 00	47 30	59 00	47.5
III.	48 00	97 00	50 00	60 00	42.5
IV.	50 00	91 00	47 30	60 00	32.4
V.	39 45	97 30	48 45	88 00	34.4
VI.	34 15	96 45	50 15	69 00	55.0
VII.	44 45	100 00	48 45	85 30	31.2
VIII.	47 00	103 30	51 30	69 00	35.7
IX.	49 45	109 00	46 15	64 00	45.3

Mean hourly velocity, 39.4 miles.

Nine areas have been charted during the month. Most of these proved to be very violent storms on the lakes and Atlantic coast. With the exception of numbers i., iv., and ix., they have developed within the limits of the chart. Number iii. was the severest storm occurring during November, both on the lakes and the Atlantic coast. Number viii. was especially severe on the lower lakes.

I.—This area first made its appearance in the Saskatchewan valley on the morning of the 4th. During that day the cloudiness increased in the upper lake region, Mississippi and Missouri valleys with light local rains in those districts. On the morning of the 5th the centre was north of Minnesota, and general rains reported from the districts previously mentioned. The winds on the lakes had increased considerably in force. At midnight of the 5th the depression was central over eastern Michigan, having, up to this report, pursued a southeasterly direction. The rain area embraced Tennessee and the Ohio valley, lake region and Mississippi valley. After this report the disturbance changed its course to a northeasterly direction, moving with greater rapidity, accompanied by high winds on the lower lakes, and at the morning report of the 6th it was central east of the Georgian bay. On the 7th the centre was over the Gulf of Saint Lawrence, and the area passed beyond the limits of the chart on that date. Light rains fell in the middle, south Atlantic, and New England states, and high westerly winds prevailed on the Atlantic coast. The lowest barometer reading observed was 29.50 at Saugeen, Canada, on the 6th.

II.—This area developed in Kansas during the afternoon of the 8th. At that report the barometer had fallen considerably, the pressure being .52 of an inch below the normal at Leavenworth, Kansas, where light rain had fallen. Moving in a northeasterly direction, accompanied by rain, this depression was central on the morning of the 9th over eastern Michigan. During the 9th it increased somewhat in energy, the winds on the lower lakes blowing strongly from the west. Passing over the St. Lawrence valley and northern Maine, the area was central on the 10th over the Gulf of St. Lawrence, on which date it passed beyond observation. Rain fell in all districts north of the Gulf and south Atlantic states. The lowest barometer observed was 29.39 inches at Toronto, Canada, on the 9th.

III.—This storm proved to be the most violent of the month. Light snow began to fall during the evening of the 10th, in the extreme northwest, and the barometer in that district fell slowly. At the 11 p. m. report of the 10th, the pressure at Moorhead, Minnesota, was .43 of an inch below the normal. After its development, the area increased in energy as it advanced eastward. The morning report of the 11th showed the centre of disturbance was over Lake Superior. The winds on the upper lakes increased in force, and during the day reached a velocity of over fifty miles an hour on Lake Michigan, and, by the evening, became quite violent on the lower lakes—from twenty-six to fifty-five miles per hour. On the 12th the area was central over the lower Saint Lawrence valley, and on that date passed beyond limits of the chart. Westerly gales prevailed on the Atlantic coast during its passage, and were especially severe on the New Jersey coast where the wind reached a velocity as high as sixty-eight miles. Rain and snow fell in all of the northern districts. The movement of translation was very rapid. The lowest barometer observed was 28.42 inches at Anticosti Island, Gulf of Saint Lawrence, on the 12th.

IV.—This weak depression was first observed during the evening of the 12th north of Minnesota. On the morning of the 13th it was central north of Lake Superior. On the 14th it was central over the lower Saint Lawrence valley. Light snow had fallen in the lake region and rain in the middle Atlantic and New England states. After this report it altered its previous southeasterly course to a direction a little north of east, and on the 15th disappeared, passing over Newfoundland.

V.—This area developed in western Kansas during the afternoon of the 19th. On the 20th it had moved in a northeasterly direction and was central over western Michigan, and during the afternoon passed into British America, north of Lake Superior. This storm had but little energy, but the area of precipitation extended over all districts.

VI.—The barometer, at the morning report of the 21st, showed a marked fall in the western portion of the Indian Territory. During the day the pressure diminished rapidly, and the area, accompanied by rain, moved in a northeasterly direction to eastern Michigan, where it was central at midnight of the 21st. As it approached the lake region, the winds, especially on the lower lakes, increased in force and blew with great violence, reaching a velocity of from forty to forty-eight miles an hour. On the morning of the 22d the disturbance was central north of Rockcliffe, Canada, and continuing its northeasterly course the area passed beyond the limits of observation during the afternoon of the 22d. The lowest barometer observed was 29.28 inches, at Rockcliffe on the 22d.

VII.—The midnight report of the 22d showed that the barometer had fallen slightly in the previous eight hours in the Missouri valley, the pressure at Huron, Dakota, being .44 of an inch below the normal. The depression had but little energy. It advanced in the first eight hours after its development in a direction nearly east, but after reaching the upper Mississippi valley, on the afternoon of the 23d, it altered its course and moved more to the northeast, passing over Lake Superior, and disappearing into British America on the 24th. Light rains fell in the northern districts and light winds prevailed on the lakes during its passage.

VIII.—This depression developed during the evening of the 24th in northern Dakota. The pressure at Bismarck at the midnight report being .60 of an inch below the normal, with a fall in the barometer of .34 of an inch in eight hours. The storm first advanced northeasterly to Manitoba, where it was central on the morning of the 25th. Easterly winds had prevailed in the upper lakes, increasing in force as the disturbance approached that region. The afternoon report of the 25th showed the centre to be over southern Minnesota, the storm having moved in nearly a south-southeasterly direction from Manitoba. At this hour general rains were falling in nearly all districts. The winds on the upper lakes became quite violent, shifting to a westerly direction and blowing with renewed force, owing to the rapid increase in pressure in rear of the storm. The winds on the lower lakes, though not as high as those on the upper lakes, were, however, very dangerous. On the morning of the 26th the centre of disturbance was over the northern portion of lake Michigan, having moved northeasterly from southern Minnesota. The area moved very rapidly after this report and, on the morning of the 27th, was some distance north of the lower Saint Lawrence valley, disappearing on that date. Severe gales occurred on the Atlantic coast during the passage of this depression. The lowest barometer observed was 29.41 at Saint Vincent, Minnesota, on the 25th.

IX.—This depression made its appearance north of Montana at midnight of the 28th. On the morning of the 29th it was central over Dakota. The area moved with great rapidity and, after the morning report of the 29th, increased considerably in energy as it approached the Atlantic, causing high winds on the New England coast. The morning report of the 30th showed the depression to be central over the Saint Lawrence valley, and after midnight of that date it passed into the Atlantic off Nova Scotia. Light rains fell during its passage in the northern districts.

NORTH ATLANTIC STORMS DURING NOVEMBER, 1883.

[*Pressure expressed in inches and in millimetres; wind-force by scale of* 0—10.]

Chart ii. exhibits the tracks of the principal depressions that have moved over the north Atlantic ocean during November, 1883. The location of the various storm-centres has been approximately determined from reports of observations furnished by agents and captains of ocean steamships and sailing